# Internet Telephony Gateway

# 2 & 4 Port DeskTop Version User's Guide

# Table of Contents

**Chapter 1 Overview 1**

1.1 Features 1
1.2 Front Panel 1
LED Indicators 1
Reset Button 2
1.3 Rear Panel 2
LAN / Console Ports 2

**Chapter 2 Installing the ITG 3**

2.1 Network Requirements 3
2.2 Installing the ITG 3
2.3 Connecting to the telephony devices 3
2.4 Connecting to the Network 3
2.5 Providing Power to the ITG 3
2.6 Assigning IP address to the ITG 4

**Chapter 3 Configuring ITG from a Web Browser 5**

3.1 Web Browser setting sample 5

**Chapter 4 Making a Call with ITG 19**

4.1 Making a call with ITG FXS Module 19
4.2 Making a call with ITG FXO Module 19
4.3 Making a call with ITG Application Sample 20

**Chapter 5 Application Samples 24**

5.1 Module Configuration 24

**Chapter 6 Troubleshooting Tips 27**

# Chapter 1 Overview

This chapter gives an overview of the 2 ports & 4 ports desktop version Internet Telephony Gateway (ITG) and a detailed description of its front panel and rear panel.

## 1.1 Features

The ITG is a cost-effective and highly reliable analog Voice over IP (VoIP) Gateway that offers toll quality voice and real-time fax data over IP networks. With its embedded architecture, the gateway is ideal for VoIP applications associated with Remote Office and Branch Office (ROBO) environments. With its built-in user-friendly interface, the gateway may be installed easily and conveniently to yield immediate cost savings. One Internet Telephony Gateway supports up to eight voice or Fax communications simultaneously.

Implemented with an efficient Real-Time Operating System (RTOS) and flash memory, the ITG provides upgradeable capabilities, so it may be programmed with updated firmware locally or via the network at any time. It comes equipped with remote management capabilities, configurable signaling to work with PBX, KTS, and/or telephone. The ITG utilizes advanced VoIP related technology. It includes various voice coders and fax algorithms, echo cancellation, Voice Activity Detection (VAD) , Comfort Noise Generation (CNG) , and lost packet recovery algorithms.

## 1.2 Front Panel

The front panel of the ITG contains a push button and LED indicators. The following figure illustrates the front panel of the ITG.

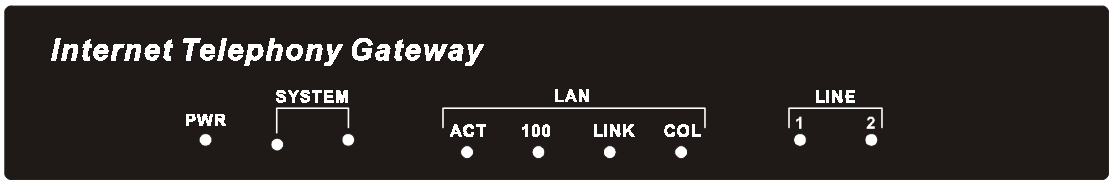



*Figure 1-1 2 ports ITG Front Panel*

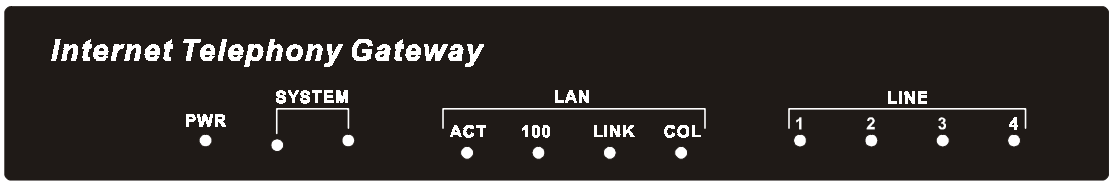



*Figure 1-2 4 ports ITG Front Panel*

### LED Indicators

The LED indicators on the front panel display the current status of the ITG as described in the following table:

| Indicator | Color | Activity | Indication |
|---|---|---|---|
| PWR | Green | On | Power is supplied to the gateway. |
| SYSTEM | Green | Blinking | The system is running. (Heartbeat LED) |
| LAN | | | |
| • ACT | Green | On | Data is presented on LAN. |
| • 100M | Green | On | The gateway is connected to LAN at 100Mb/s. |
| | | Off | The gateway is connected to LAN at 10Mb/s. |
| • LNK | Green | On | The gateway is connected to LAN. |
| • COL | Green | On | Data collision is occurring on the network connection. |
| LINE Channels 1-4 | Green | Off | The line is idle. |
| | | On | The line is being used. |
| | | Blinking | The line is ringing. |

### Reset Button

There is a push button located behind a small hole next to the SYSTEM LED. This button allows you to reset the ITG or force the ITG to enter firmware upgrade mode.

To reset the gateway, push a small, stiff object into the hole until the SYSTEM LED stops blinking, then release the button.

Powering on the gateway while pressing down the button for 5 seconds forces the ITG to enter download mode

## 1.3 Rear Panel

The rear panel of the ITG has two FXS ports for 2 ports ITG and four ports with two FXO and two FXS ports for 4 ports ITG. Depending on the type of the telephony interface. The telephony interface ports may be connected to telephony devices, such as PBX, KTS, and telephone sets of central office. In addition to the telephony interface ports, there is an power adapter connection hole on the rear panel.

### LAN / Console Ports

The ITG is equipped with an Ethernet interface with 10/100 Mbps auto-negotiation capability. The Ethernet interface port is located on the rear panel. In addition to the Ethernet interface port, there is a 9-pin RS-232 interface port on the rear panel. Their functions are described below:

| Port | Label | Function |
|---|---|---|
| RJ45 | LAN | Connecting the ITG to a 10/100 Mbps Ethernet network |
| 9-pin RS-232 | User Console | Connecting the ITG to a VT-100 terminal or terminal emulator for configuring the ITG |

# Chapter 2 Installing the ITG

This chapter gives information on how to install the ITG.

## 2.1 Network Requirements

For the ITG to successfully operate in your network, your network must meet the following requirements:

1. A working 10/100 Base-T Ethernet. The ITG connects to Internet via an Ethernet LAN.
2. IP network that supports gateway, and subnet mask. You'll need a static IP address to assign the ITG.

## 2.2 Installing the ITG

Due to the ITG is used in a desktop configuration. Ensure that the ITG is placed in a clean, well-ventilated, and vibration-free environment.

When the ITG is used, be certain that the unit is placed on a sturdy, flat surface, near a grounded power outlet. At least three inches of clearance must be provided on both sides of the ITG for good ventilation.

## 2.3 Connecting to the telephony devices

The ITG supports two types of TIM. One is FXO and the other is FXS. 2 ports ITG supports FXS only, and 4 ports ITG supports 2 FXO and 2 FXS. Each port has RJ11 ports for connecting to telephony devices.

The FXO module is designed for connecting to PBXs or central office switches.

The FXS module is designed for connecting to analog telephone sets or G3 fax machines. Connecting the telephony devices to the appropriate RJ11 ports on the TIM.

***Warning:*** *connection of incorrect telephony devices to the ports on the TIM can cause permanent damage to the TIM and/or the ITG*.

## 2.4 Connecting to the Network

The RJ45 network port on the rear panel supports 10/100 Mbps half-duplex connections to Ethernet. You can use either Category 3 or 5 straight-through UTP cable for 10 Mbps connections, but use Category 5 for 100 Mbps connections. To connect to Ethernet, insert one end of the Ethernet cable to the RJ45 port on the rear panel of the ITG and other end of the cable to an Ethernet switching hub or repeater hub.

## 2.5 Providing Power to the ITG

To provide power to the ITG complete the following steps:

1. Connect one end of the power cord that came with the ITG to the power receptacle on the rear panel.
2. Connect the other end of the power cord to an AC power outlet.

3. The ITG will execute the memory testing and application code automatically..

## 2.6 Assigning IP address to the ITG

The IP address is the unique logical address identifying each IP node, such as the ITG, on an IP network. An IP address is a 32-bit number expressed as four decimal numbers from 0 to 255 separated by periods. The ITG needs a static IP address and be aware of the subnet mask and default gateway (typically a router) of your network to be able to send to and receive data from the IP network. Consult your network manager to obtain a unique and static IP address for the ITG, the IP subnet mask and default gateway of your network, and fill out the work sheet in Appendix D before configuring the gateway. Procedures for assigning IP address, default gateway and subnet mask is available in Chapter 4.

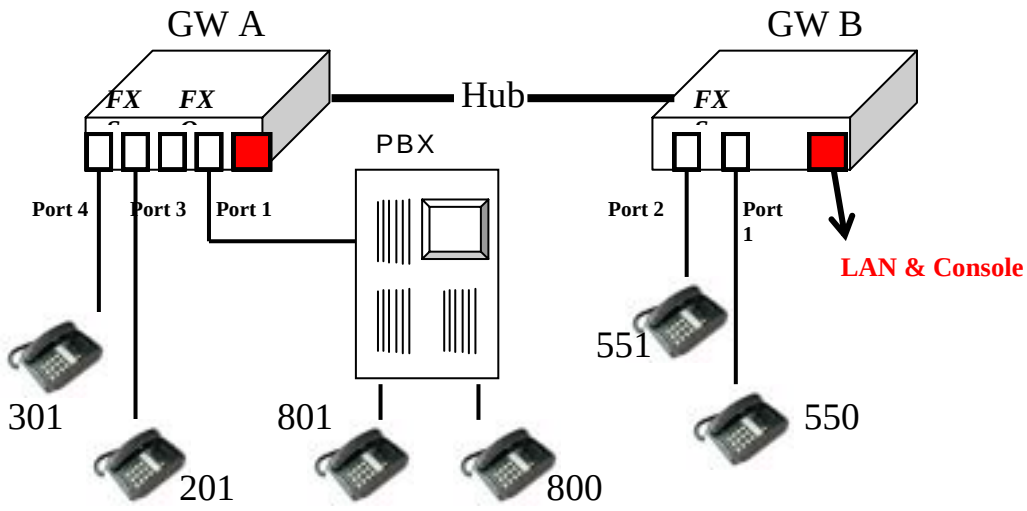
# Chapter 3 Configuring ITG from a Web Browser

## 3.1 Web Browser setting sample

This section describes how to use web browser to build a sample scenario dial plan in ITG. We suggest some steps to setup dial plan at web browser setting,

1. Please draw down scenario to have a VoIP call application
2. Local gateway: IP setup
3. Local gateway: local telephone number setup
4. Local gateway: remote gateway IP & remote telephone number setup

**Please draw down scenario to have a VoIP call application**
In order to describe the dial plan of Internet Telephony Gateway, we would like to have the following scenario to step by step the gateway setting by web browser. In case, you don't have PBX on hand, please ignore GW A Port 1 setting.

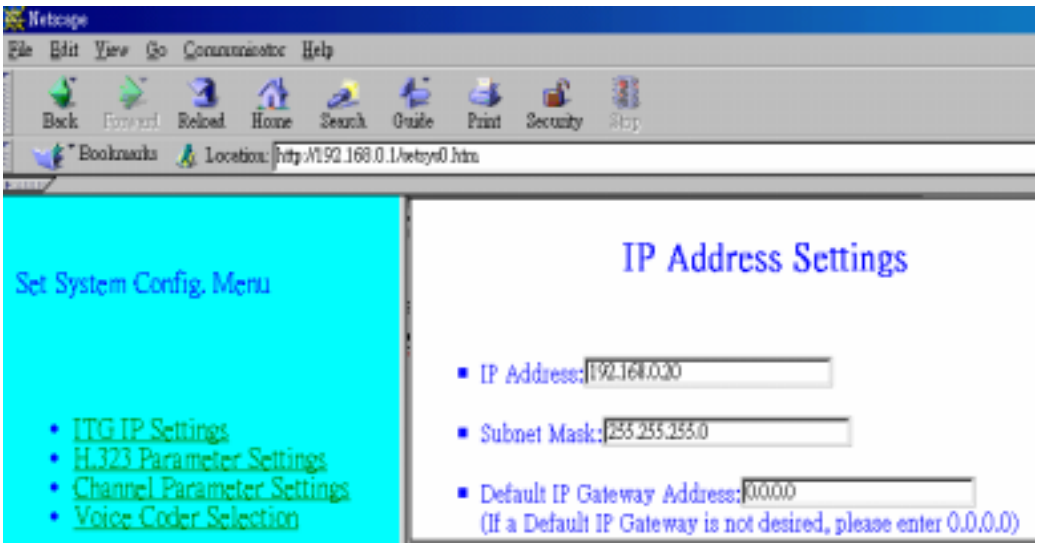



Scenario description: There are two gateways connected by a Hub.
Gateway A, 4 ports ITG, is configured as following:
1. Gateway A IP: 192.168.0.20, mask IP: 255.255.255.0, gateway IP 0.0.0.0 (virtual IP)
2. Port 1 of FXO is connected to PBX. There are two telephone sets connected by PBX, their phone numbers are 800 and 801.
3. Port 3 of FXS has a telephone set connected, its phone number is 201
4. Port 4 of FXS has a telephone set connected, its phone number is 301

Gateway B, 2 ports ITG, is configured as following:
1. Gateway B IP: 192.168.0.55, mask IP: 255.255.255.0, gateway IP 0.0.0.0 (virtual IP)
2. Port 1 of FXS has a telephone set connected, its phone number is 550
3. Port 2 of FXS has a telephone set connected, its phone number is 551

Local gateway: IP setup, we are setting gateway A.
1. Please select Main Menu\ Configure System Settings\ ITG IP Settings from Main Menu

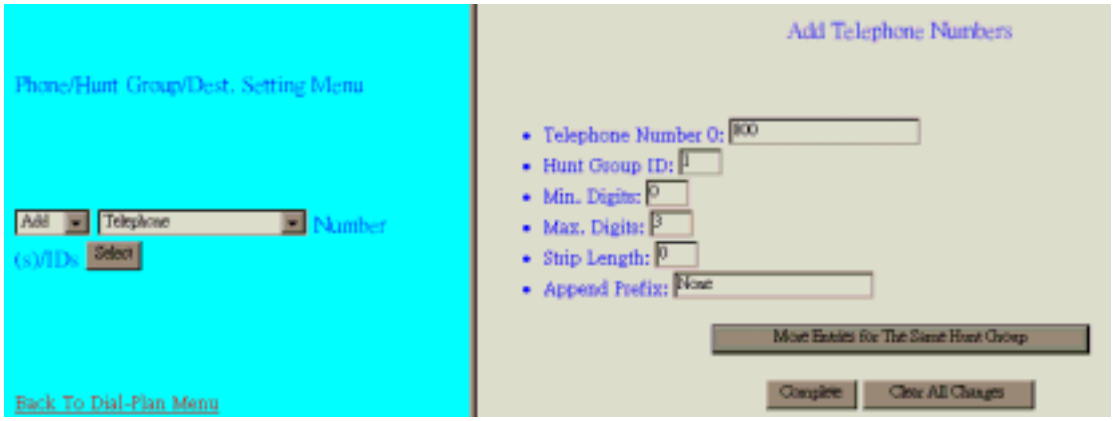
2. Key-in IP Address: 192.168.0.20, Subnet Mask: 255.255.255.0 and Default IP Gateway Address: 0.0.0.0 in the related fields.
3. And push "Save The Change" button


Netscape
File Edit View Go Communicator Help
Back Forward Reload Home Search Guide Print Security Stop
Bookmarks Location: http://192.168.0.1/setsys0.htm
Set System Config. Menu
ITG IP Settings
H.323 Parameter Settings
Channel Parameter Settings
Voice Coder Selection
IP Address Settings
IP Address: 192.168.0.20
Subnet Mask: 255.255.255.0
Default IP Gateway Address: 0.0.0.0
(If a Default IP Gateway is not desired, please enter 0.0.0.0)

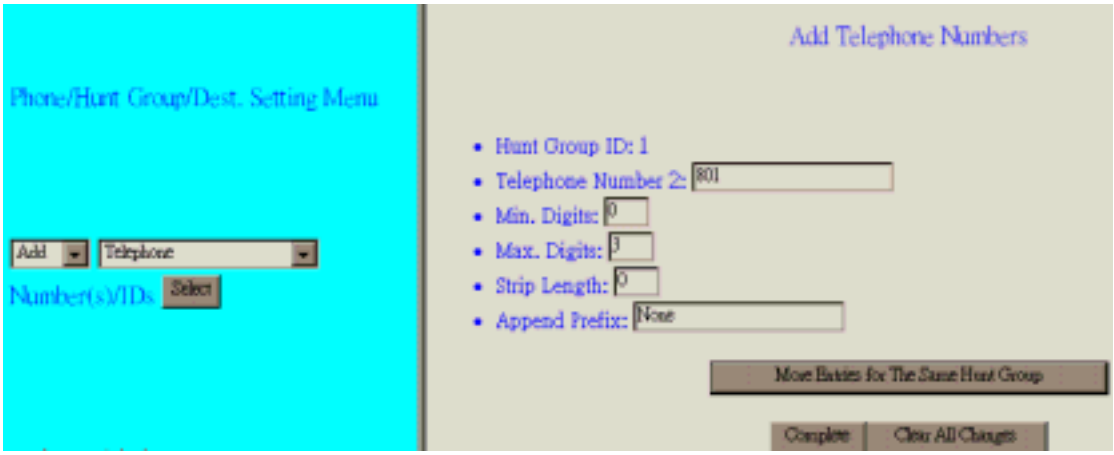
Local gateway: local telephone number setup

Gateway A's telephone number 800 setting. 800 locates at Port 1 of FXO

1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add telephone" from Main Menu



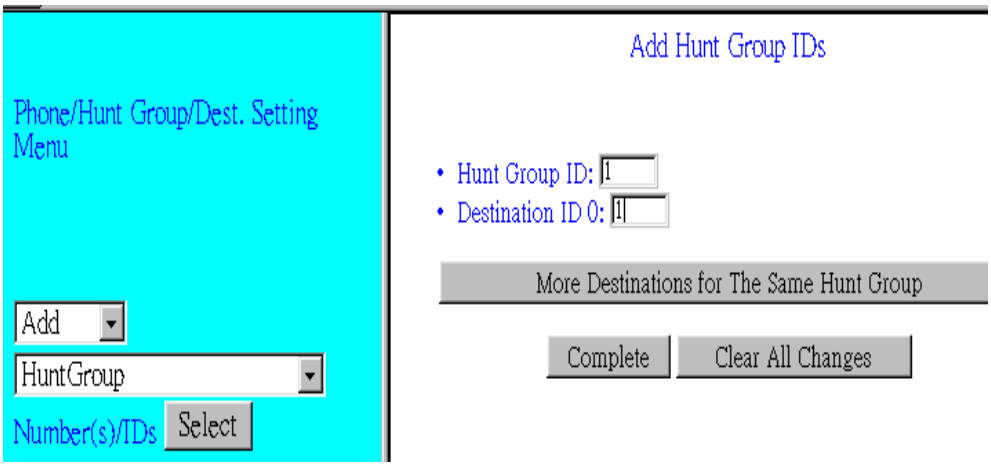

2. Push "More Entries for The Same Hunt Group" button.




3. Push "Complete" button. And screen will show "Telephone Number Added 800, 801 OK" table. Telephone number 800, 801 are added in gateway dial plan.
4. Purpose: add telephone address to hunt group mapping table of phone number 200 into dial plan

Back To Dial-Plan Menu

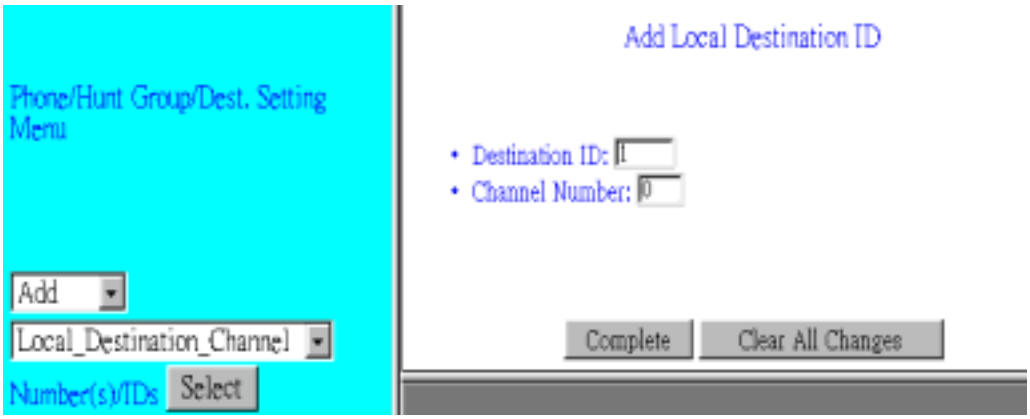
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Hunt Group" from Main Menu




2. Push "Complete" button. And screen will show "List All Hunt Group IDs Result:" table.
3. Purpose: add hunt group to destination ID mapping table of phone number 200 into dial plan

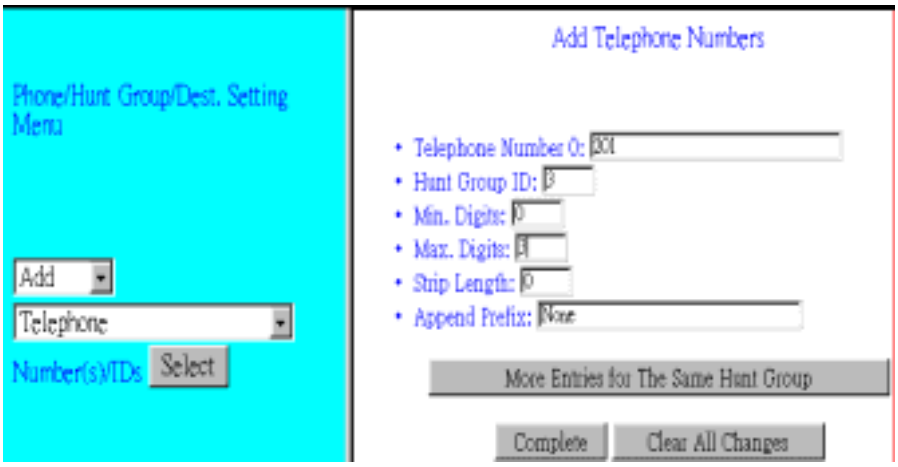
Back To Dial-Plan Menu

1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Local_Destination_Channel" from Main Menu



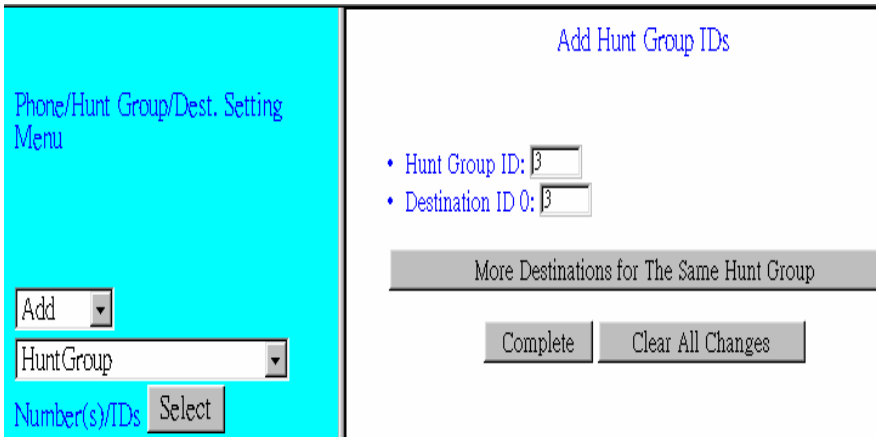

2. Push "Complete" button. And screen will show "Add Destination ID Result:" table The Destination ID 1 is bound to local channel 0.
3. Purpose: add destination ID to destination IP mapping table of phone number 200 into dial plan. Channel Number can have values from 0 to (number of ports –1)

Back To Dial-Plan Menu
Gateway A's telephone number 201 setting. 201 locates at Port 3 of FXS
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add telephone" from Main Menu




2. Push "Complete" button. And screen will show "Telephone Number Added 201 OK" table. Telephone number 201 is added in gateway dial plan.
3. Purpose: add telephone address to hunt group mapping table of phone number 201 into dial plan

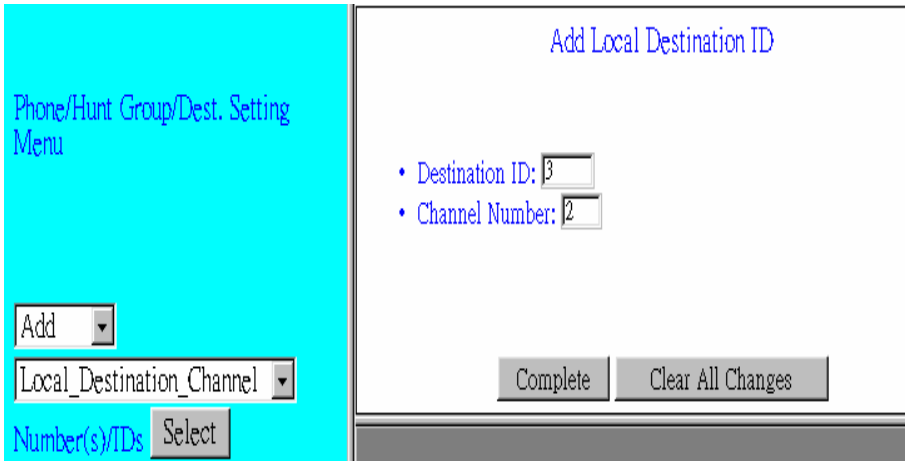
Back To Dial-Plan Menu
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Hunt Group" from Main Menu




2. Push "Complete" button. And screen will show "List All Hunt Group IDs Result:" table.
3. Purpose: add hunt group to destination ID mapping table of phone number 201 into dial plan

Back To Dial-Plan Menu

1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Local_Destination_Channel" from Main Menu

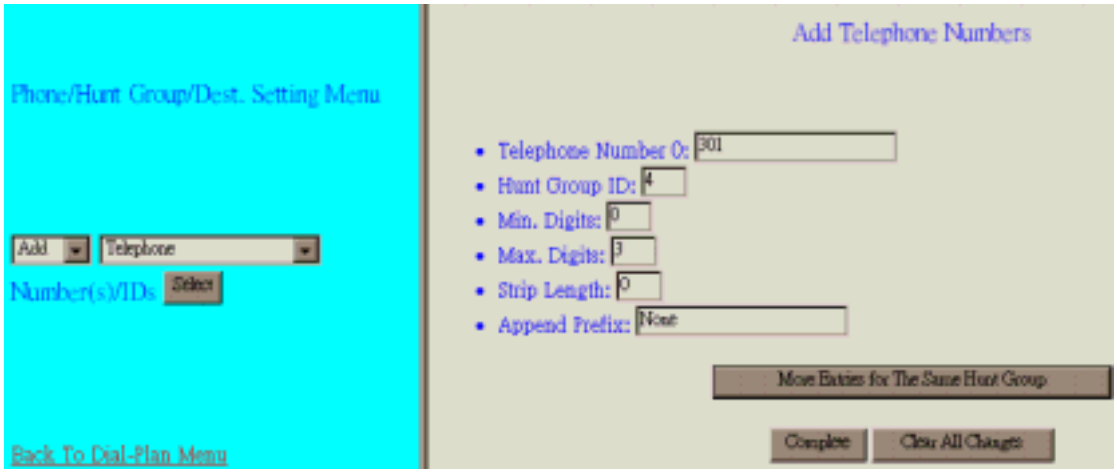



2. Push "Complete" button. And screen will show "Add Destination ID Result:" table
   The Destination ID 3 is bound to local channel 2.
3. Purpose: add destination ID to destination IP mapping table of phone number 201 into dial plan

Back To Dial-Plan Menu

Gateway A's telephone number 301 setting. 301 locate in Port 4.

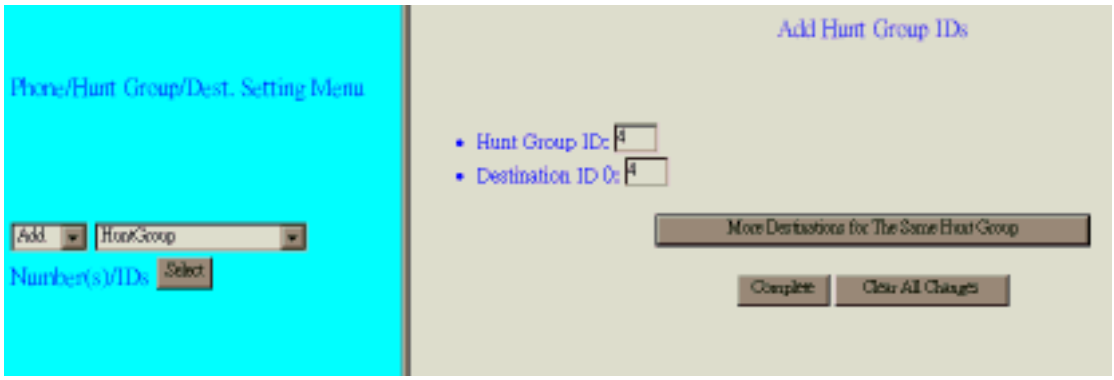
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Telephone" from Main Menu
2. Push "Complete" button. And screen will show "Telephone Number Added 301 OK" table. Telephone number 301 is added in gateway dial plan.
3. Purpose: add telephone address to hunt group mapping table of phone number 301 into dial plan




4. Purpose: add telephone address to hunt group mapping table of phone number 301 into dial plan

Back To Dial-Plan Menu

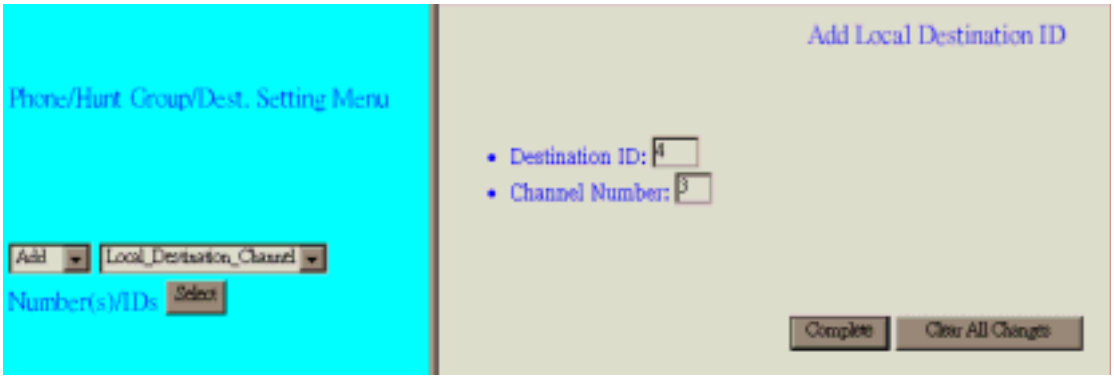
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Hunt Group" from Main Menu




2. Push "Complete" button. And screen will show "List All Hunt Group IDs Result:" table.
3. Purpose: add hunt group to destination ID mapping table of phone number 301 into dial plan

Back To Dial-Plan Menu

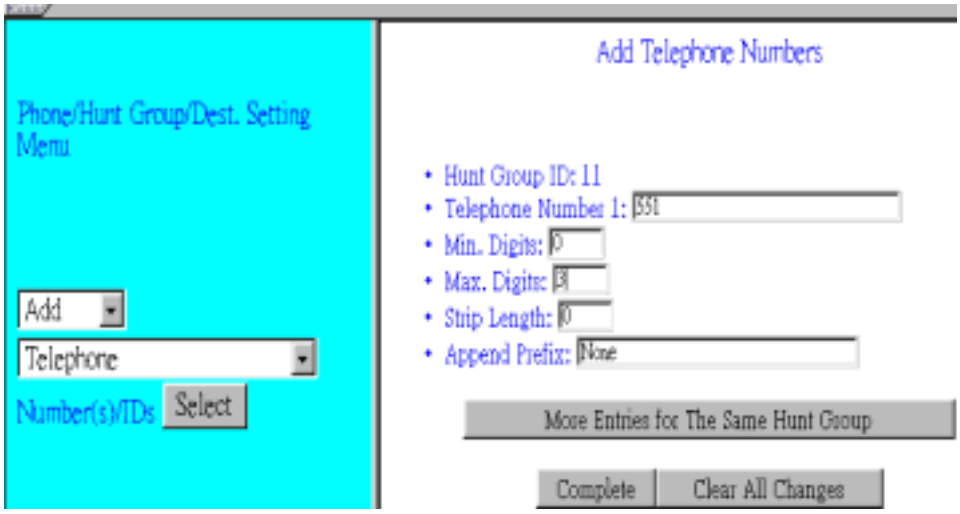
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Local_Destination_Channel" from Main Menu
2. Push "Complete" button. And screen will show "Add Destination ID Result:" table
   The Destination ID 4 is bound to local channel 3.
3. Purpose: add destination ID to destination IP mapping table of phone number 301 into dial plan




Local gateway: remote gateway IP & remote telephone number setup

Gateway A's remote gateway IP & remote telephone number 550 & 551 setting

Back To Dial-Plan Menu
Gateway A's remote telephone number 550 & 551 setting. Due to 550 & 551 locate in remote gateway, we usually define its hunt group number is beginning at number 11 at this dial plan setting.
1. Please select "Main Menu\Dial Plan\Phone/Hunt Group/Destination Settings\Phone/Hunt Group/Dest. Setting Menu" from Main Menu



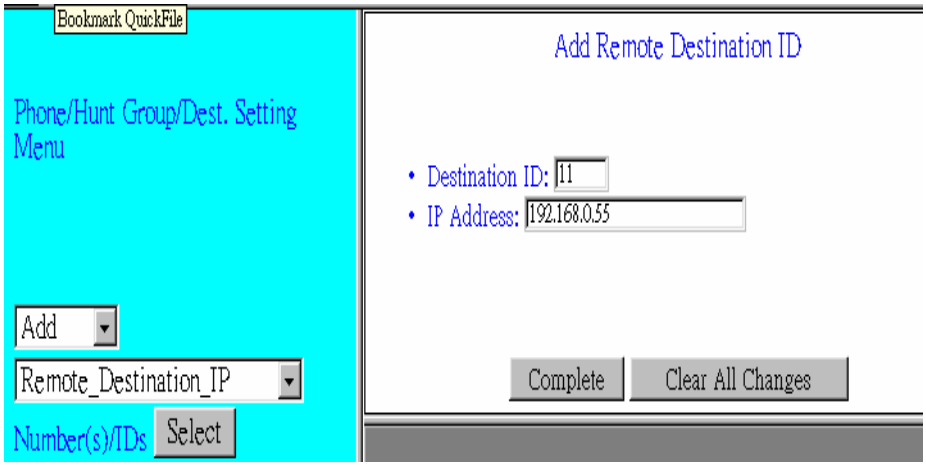

2. Key-in 550 firstly, and push "More Entries for The Same Hunt Group" button and key-in 551.
3. Push "Complete" button. And screen will show "Telephone Number Added 550 & 551 OK" table. Telephone number 550 & 551 are stored in gateway dial plan.
4. Purpose: add telephone address to hunt group mapping table of phone number 550 & 551 into dial plan

Back To Dial-Plan Menu
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Hunt Group" from Main Menu

2. Push "Complete" button. And screen will show "List All Hunt Group IDs Result:" table.
3. Purpose: add hunt group to destination ID mapping table of phone number 550 & 551 into dial plan

Back To Dial-Plan Menu

1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Remote_Destination_IP" from Main Menu




2. Push "Complete" button. And screen will show "Add Destination ID Result: The Destination ID 11 is bound to IP address 192.168.0.55 for H.323 VoIP application."
3. Purpose: add destination ID to destination IP mapping table of phone number 550 & 551 into dial plan

Back To Dial-Plan Menu

Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ List Telephone" from Main Menu, we can list the above telephone number setting.

Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ List Hunt Group" from Main Menu, we can list the above hunt group setting.

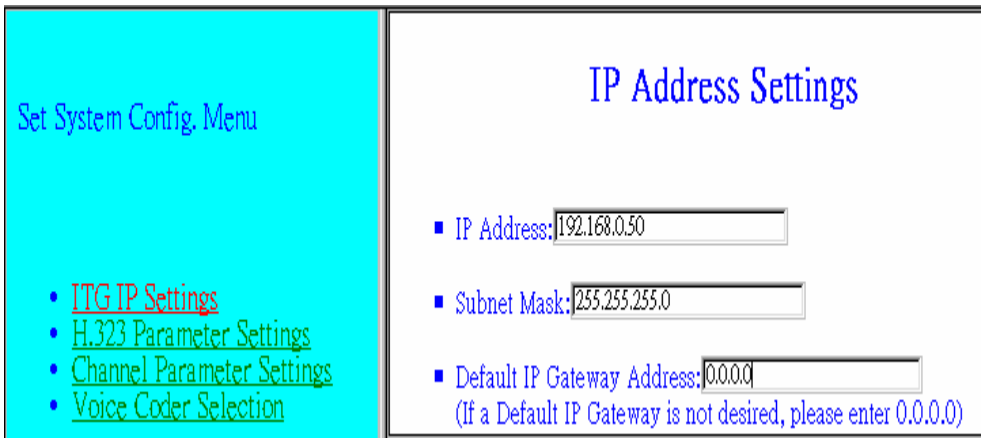
Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu" from Main Menu and select List Remote_Destination_IP or Local_Destination_Channel, we can list the above destination ID setting.

Please select Main Menu\Dial Plan\Store Settings To Flash. The above setting will be stored to flash memory.

At this moment we have finished gateway A VoIP call application setting. We are going to have the same process to setup gateway B.

Local gateway: IP setup, we are setting gateway B.

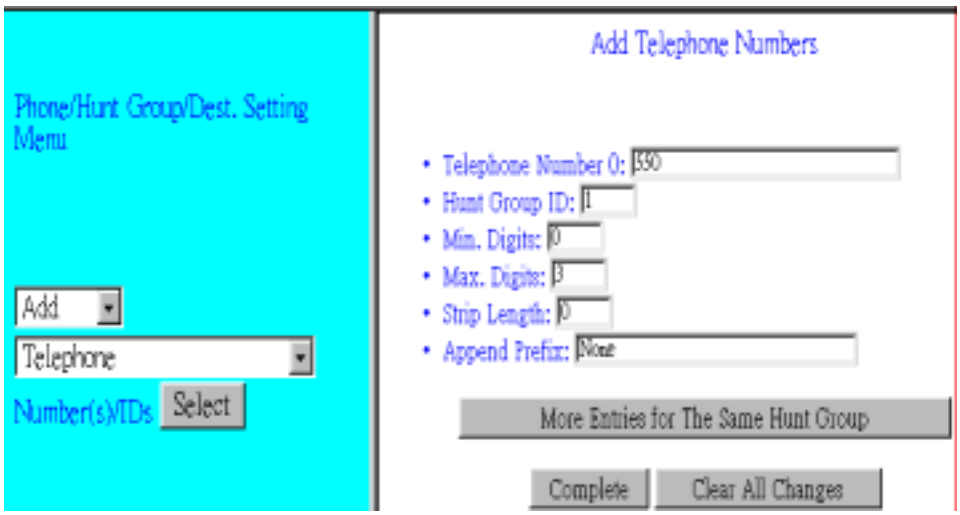
1. Please select Main Menu\ Configure System Settings\ ITG IP Settings from Main Menu
2. Key-in IP Address: 192.168.0.50, Subnet Mask: 255.255.255.0 and Default IP Gateway Address: 0.0.0.0 in the related fields.
3. And push "Save The Change" button


Set System Config. Menu
ITG IP Settings
H.323 Parameter Settings
Channel Parameter Settings
Voice Coder Selection
IP Address Settings
IP Address: 192.168.0.50
Subnet Mask: 255.255.255.0
Default IP Gateway Address: 0.0.0.0
(If a Default IP Gateway is not desired, please enter 0.0.0.0)

Local gateway: local telephone number setup

Gateway B's telephone number 550 setting. 550 locates at Port 1 of 2 ports ITG

1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Telephone" from Main Menu

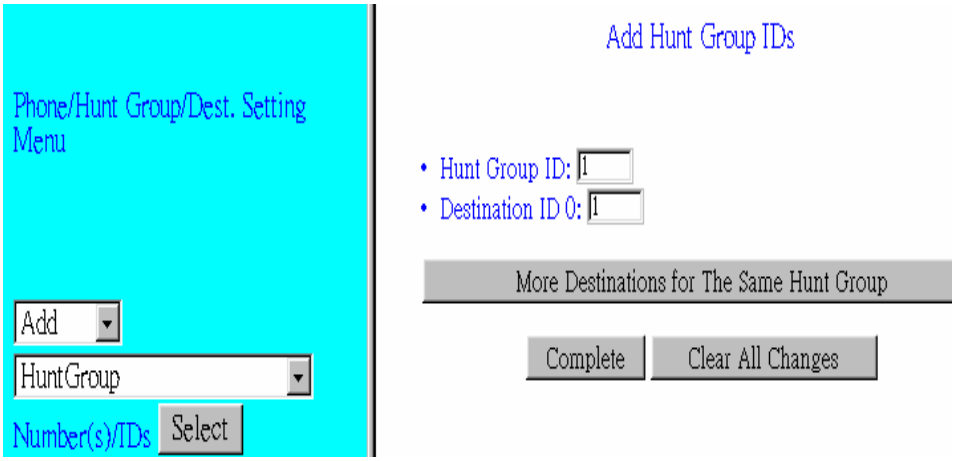



2. Push "Complete" button. And screen will show "Telephone Number Added 550 OK" table. Telephone number 550 is stored in gateway dial plan.

3. Purpose: add telephone address to hunt group mapping table of phone number 550 into dial plan

Back To Dial-Plan Menu

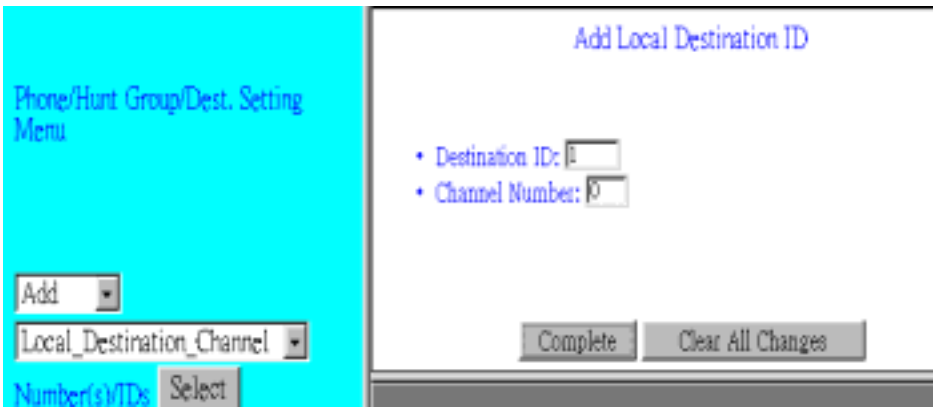
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Hunt Group" from Main Menu




2. Push "Complete" button. And screen will show "List All Hunt Group IDs Result:" table.
3. Purpose: add hunt group to destination ID mapping table of phone number 550 into dial plan

Back To Dial-Plan Menu

1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Local_Destination_Channel" from Main Menu

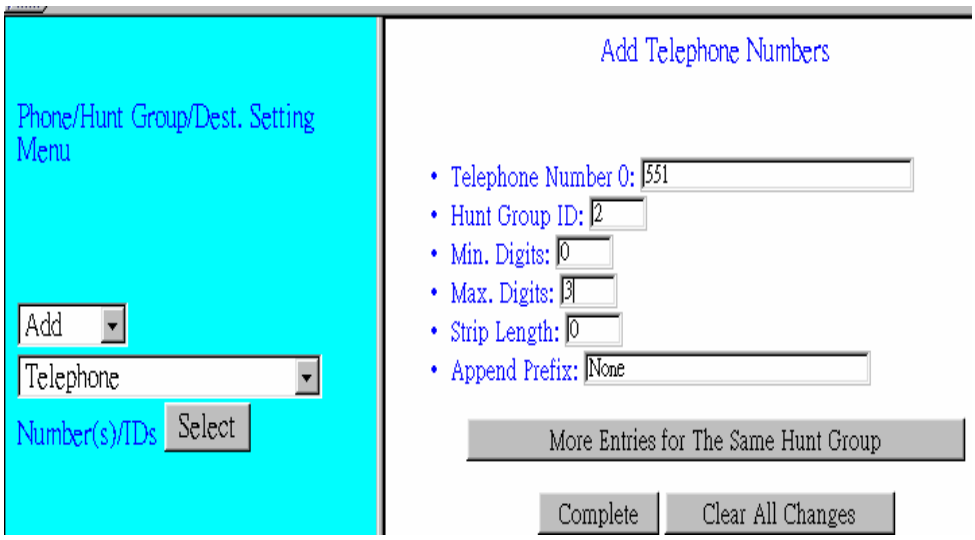



2. Push "Complete" button. And screen will show "Add Destination ID Result:" table
   The Destination ID 1 is bound to local channel 0.
3. Purpose: add destination ID to destination IP mapping table of phone number 550 into dial plan

Gateway B's telephone number 551 setting. 551 locates at Port 2

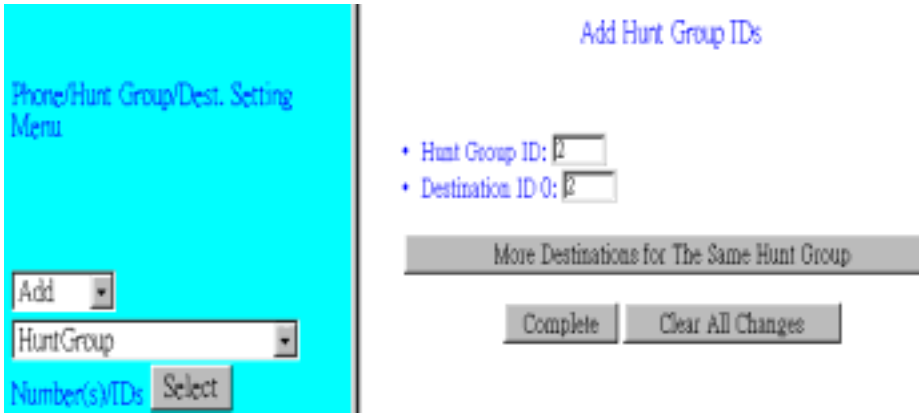
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings \ Phone/Hunt Group/Dest. Setting Menu\ Add Telephone" from Main Menu
2. Push "Complete" button. And screen will show "Telephone Number Added 551 OK" table. Telephone number 551 is stored in gateway dial plan.

3. Purpose: add telephone address to hunt group mapping table of phone number 551 into dial plan




Back To Dial-Plan Menu

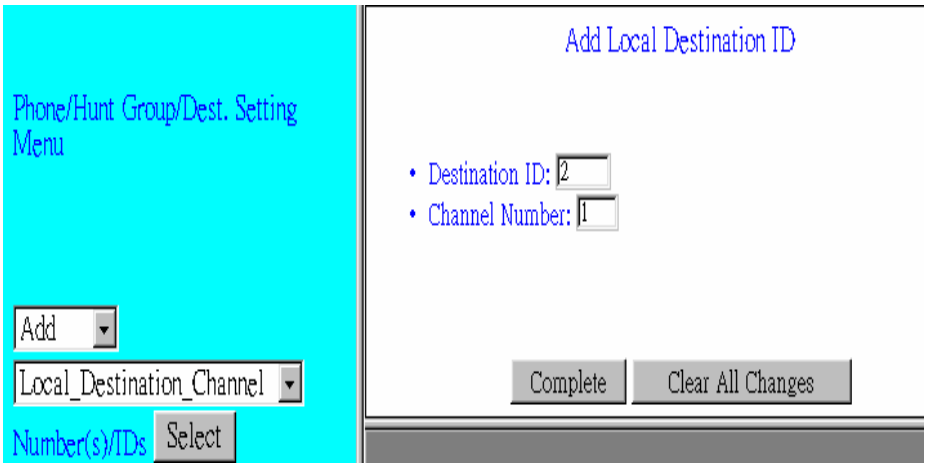
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Hunt Group" from Main Menu




2. Push "Complete" button. And screen will show "List All Hunt Group IDs Result:" table.
3. Purpose: add hunt group to destination ID mapping table of phone number 551 into dial plan

Back To Dial-Plan Menu

1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Local_Destination_Channel" from Main Menu
2. Push "Complete" button. And screen will show "Add Destination ID Result:" table
   The Destination ID 2 is bound to local channel 1.
3. Purpose: add destination ID to destination IP mapping table of phone number 551 into dial plan



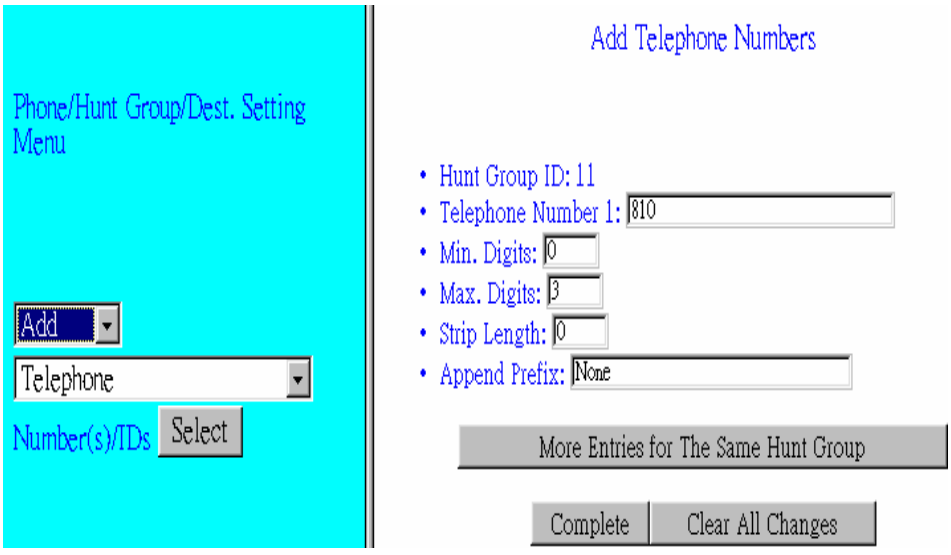

Local gateway: remote gateway IP & remote telephone number setup

Gateway B's remote gateway IP & remote telephone number 301 & 201 & 800 & 801 setting

Back To Dial-Plan Menu

Gateway B's remote telephone number 301 & 201 & 800 & 810 setting. Due to 301 & 201 & 800 & 801 locate in remote gateway, we usually define its hunt group number is beginning at number 11 at this dial plan setting.

1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Telephone" from Main Menu

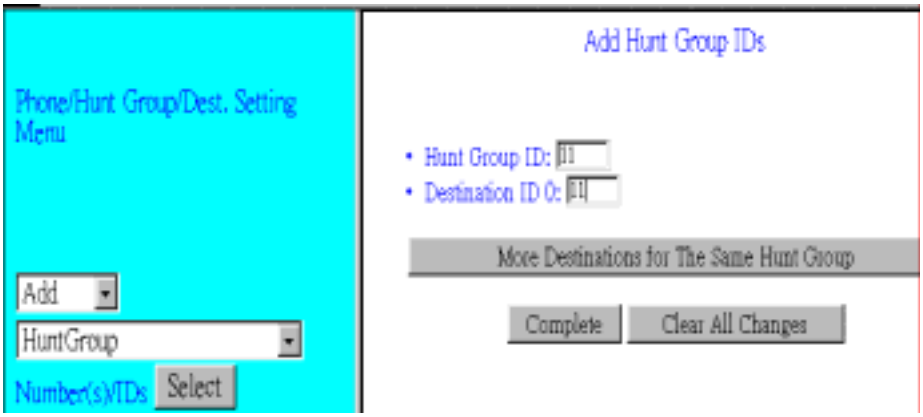



2. Key-in 301 firstly, and push "More Entries for The Same Hunt Group" button and key-in 201, and push "More Entries for The Same Hunt Group" button and key-in 800, and push "More Entries for The Same Hunt Group" button and key-in 801.
3. Push "Complete" button. And screen will show "Telephone Number Added 301 & 201 & 800 & 801 OK" table. Telephone number 301 & 201 & 800 & 801 are stored in gateway dial plan.

4. Purpose: add telephone address to hunt group mapping table of phone number 301 & 201 & 800 & 801 into dial plan

Back To Dial-Plan Menu

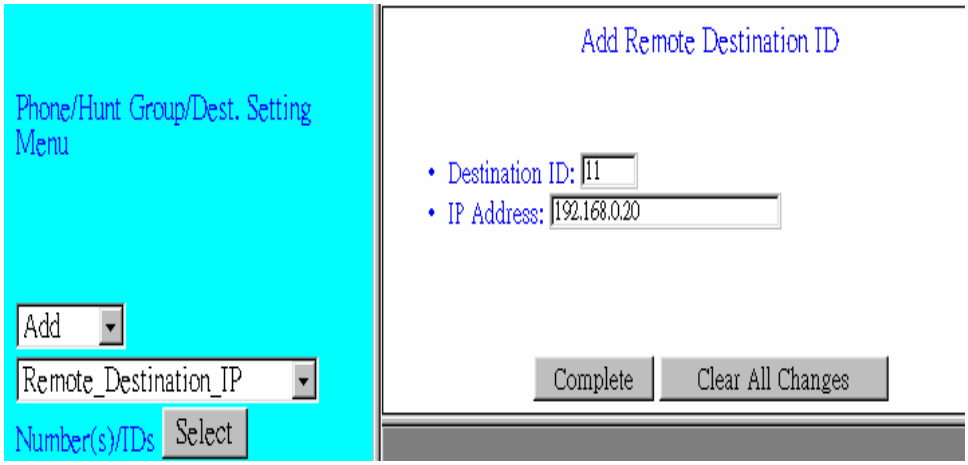
1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Hunt Group" from Main Menu




2. Push "Complete" button. And screen will show "List All Hunt Group IDs Result:" table.
3. Purpose: add hunt group to destination ID mapping table of phone number 301 & 201 & 800 & 801 into dial plan

Back To Dial-Plan Menu

1. Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ Add Remote_Destination_IP" from Main Menu




2. Push "Complete" button. And screen will show "Add Destination ID Result: The Destination ID 11 is bound to IP address 192.168.0.20 for H.323 VoIP application."
3. Purpose: add destination ID to destination IP mapping table of phone number 301 & 201 & 800 & 801 into dial plan

Back To Dial-Plan Menu

Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ List Telephone" from Main Menu, we can list the above telephone number setting.

Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu\ List Hunt Group" from Main Menu, we can list the above hunt group setting.

Please select "Main Menu\ Dial Plan\ Phone/Hunt Group/Destination Settings\ Phone/Hunt Group/Dest. Setting Menu" from Main Menu and select List Remote_Destination_IP or Local_Destination_Channel, we can list the above destination ID setting.

Please select Main Menu\Dial Plan\Store Settings To Flash. The above setting will be stored to flash memory.

We have finished gateway B VoIP call application setting. We can enjoy VoIP call between gateway A and gateway B application now.

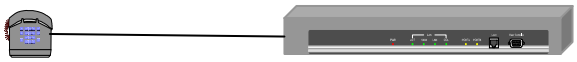
# Chapter 4 Making a Call with ITG

This chapter how to make phone calls from telephony devices connected to the ITG directly or indirectly.

## 4.1 Making a call with ITG FXS Module

ITG has two slide-in modules. FXS module can connect to analogue phone directly, and FXO module can connect to PBX.

Connection: analogue telephone set connects to FXS module port



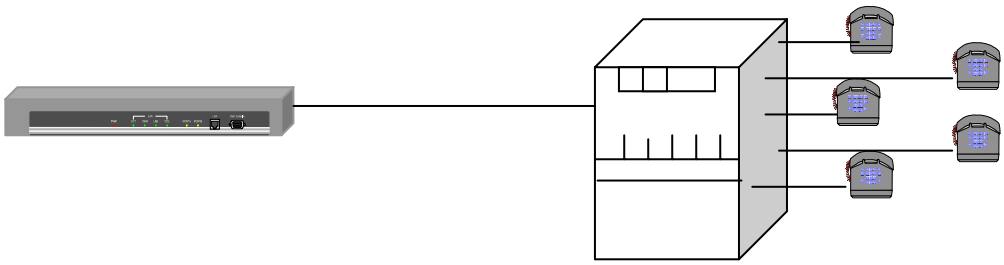
Operation:

1. Pick up this analogue telephone set, you can hear the ITG dial tone at the telephone set
2. The related LED will be lighted at the green color when the telephone set is pick up.

   For Example: If the telephone set is connected to the second port of FXS. When you pick up the telephone set, the second LED will be lighted at the green color.
3. We can dial the desired destination phone number at the telephone set. If the desired destination phone number is legal, the ITG will play two quick address ack tones, Du Du, to destination. If the desired destination phone number is illegal, the ITG will play three quick out of service tones, please check the dial plan and your desired destination phone number.

## 4.2 Making a call with ITG FXO Module

Connection: analogue telephone set connects to FXO module port



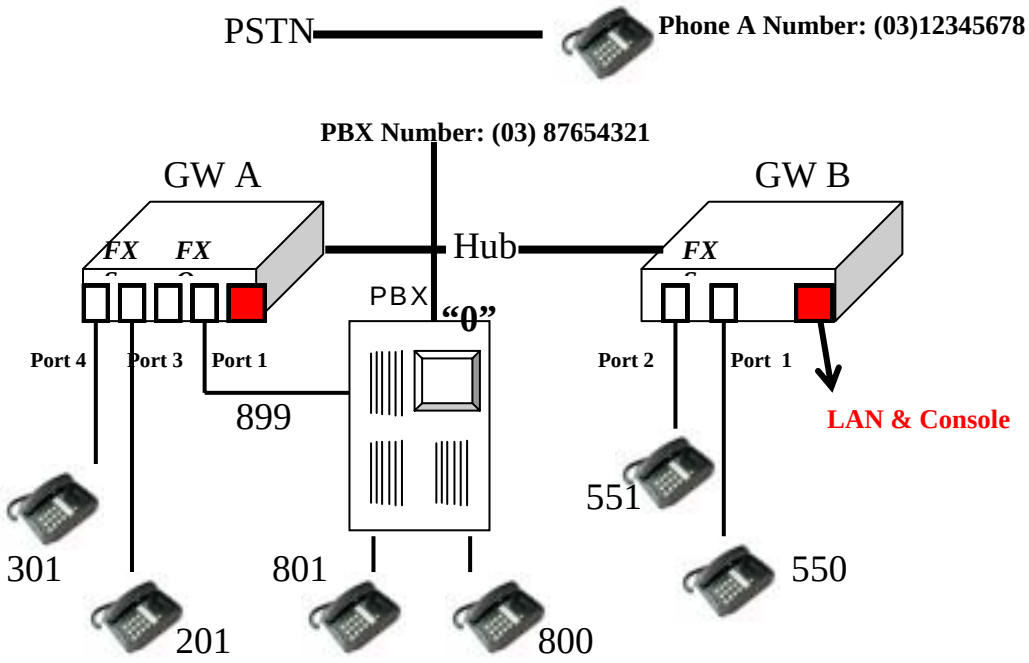
Operation:

1. Pick up this analogue telephone set, you can hear the PBX dial tone at the telephone set. In some cases, you have to dial a specific number to get the connection between telephone set and PBX.
2. Dial the phone number which is connected between PBX and ITG FXO module port.
3. When the ITG is connected, the related LED will be lighted green.

For Example: If the telephone set is connected to the second port of FXO. When the PBX is connected to ITG FXO port, the second LED will be green.

4. We can dial the desired destination phone number on the telephone set. If the desired destination phone number is legal, the ITG will plan two quick sounds, "Du Du", to destination. If the desired destination phone number is illegal, the ITG will plan out of service sound, please check the dial plan and your desired destination phone number.

## 4.3 Making a call with ITG Application Sample




**Scenario description:**

There are two gateways connected by a Hub.
Gateway A, 4 ports ITG, is configured as following:

1. Gateway A IP: 192.168.0.20, mask IP: 255.255.255.0, gateway IP 0.0.0.0 (virtual IP)
2. Port 1 of FXO is connected to PBX. There are two telephone sets connected by PBX, their phone numbers are 800 and 801.
3. PBX has a number, 899, is connected to Port 1.
4. PBX has an outside call to PSTN. Digit 0 is connected to outside call.
5. Phone number: (03) 87654321 is an PBX representative number. 03 is an area code.
6. There is telephone set, define phone A, its number is (03) 12345678.
7. Port 3 of FXS has a telephone set connected, its phone number is 201
8. Port 4 of FXS has a telephone set connected, its phone number is 301

Gateway B, 2 ports ITG, is configured as following:

1. Gateway B IP: 192.168.0.55, mask IP: 255.255.255.0, gateway IP 0.0.0.0 (virtual IP)
2. Port 1 of FXS has a telephone set connected, its phone number is 550
3. Port 2 of FXS has a telephone set connected, its phone number is 551

**Gateway A and Gateway B dial plan setting**

Gateway A address translation table

| Address Entry | Hunt Grp_Id | Min. Digits | Max. Digits | Prefix strip | Prefix Address |
|---|---|---|---|---|---|
| 201 | 3 | 3 | 3 | 0 | None |
| 301 | 4 | 3 | 3 | 0 | None |
| 8 | 1 | 3 | 3 | 0 | None |
| 899 | 1 | 3 | 3 | 0 | None |
| 0 | 1 | 1 | 1 | 0 | None |
| 03 | 1 | 0 | 10 | 2 | "0" |
| 5 | 11 | 3 | 3 | 0 | None |

Gateway A hunt group table

| Group id | Type | #Members | Member ids |
|---|---|---|---|
| 1 | 2 | 1 | 1 |
| 3 | 2 | 1 | 3 |
| 4 | 2 | 1 | 4 |
| 11 | 2 | 1 | 11 |

Gateway A destination table

| Dest id | Mode | Destination |
|---|---|---|
| 1 | Local | PORT = 0 |
| 3 | Local | PORT = 2 |
| 4 | Local | PORT = 3 |
| 11 | H.323 | Dest = 192.168.0.55/1720 TCP |

ITGB address translation table

| Address Entry | Hunt Grp_Id | Min. Digits | Max. Digits | Prefix strip | Prefix Address |
|---|---|---|---|---|---|
| 550 | 1 | 3 | 3 | 0 | None |
| 551 | 2 | 3 | 3 | 0 | None |
| 2 | 11 | 3 | 3 | 0 | None |
| 3 | 11 | 3 | 3 | 0 | "0" |
| 8 | 11 | 3 | 3 | 0 | None |
| 899 | 1 | 3 | 3 | 0 | None |
| 0 | 11 | 1 | 1 | 0 | None |
| 03 | 11 | 0 | 10 | 0 | None |

ITGB hunt group table

| Group id | Type | #Members | Member ids |
|---|---|---|---|
| 1 | 2 | 1 | 1 |
| 2 | 2 | 1 | 2 |
| 11 | 2 | 1 | 11 |

ITGB destination table

| Dest id | Mode | Destination |
|---|---|---|
| 1 | Local | PORT = 0 |
| 2 | Local | PORT = 1 |
| 11 | H.323 | Dest = 192.168.0.20/1720 TCP |

## Making a call between gateway A and Gateway B

### Case 1: Gateway Phone to Gateway Phone,

Gateway B phone 550 calls to Gateway A phone 201

| Human operation at GW B Caller side | Equipment operation | Human operation at GW A Called Side |
|---|---|---|
| Pick up phone 550 | 1.ITG dial tone is heard.<br>2.the first LED will be green at GW B. | |
| Dial 201 | 1.Du Du is heard<br>2.VoIP communication is going | |
| Ring back tone is heard | 1.The third LED is lighting at GW A. | Phone 201 is ringing |
| | | Pick up phone 201 |
| Enjoy VoIP | | Enjoy VoIP |

The above process is the same as Gateway B phone 550 calls to Gateway A phone 301, 800 and 801.

### Case 2: Gateway Phone to PSTN Phone,

Gateway B phone 550 calls to phone A number (03) 12345678

| Human operation at GW B Caller side | Equipment operation | Human operation at Phone A Receiver Side |
|---|---|---|
| Pick up phone 550 | 1.ITG dial tone is heard.<br>2. the first LED will be green at GW B | |
| Dial 889 | 1.Du Du is heard<br>2.VoIP Communication is going | |
| Ring back tone is heard | 1. The first LED is lighting at GW A. | |
| Dial 0 | 1.Gateway A is connected to PBX outside call | |
| PSTN dial tone is heard | 1.Gateway B is connected to gateway A by Hub<br>2.Gateway A is connected to PSTN | |
| Dial 12345678 | 1.PSTN communication is going | Phone 12345678 is ringing |
| Ring back tone is heard | | Phone 12345678 is ringing |
| | | Phone 12345678 picks up |
| Enjoy VoIP | | Enjoy VoIP |

The above process is the same as Gateway A phone 200 (201, 800,801) calls to phone A number (03) 12345678

### Case 3: PSTN Phone to Gateway Phone,

Phone A number (03) 12345678 calls to Gateway B phone 551

| Human operation at Phone A, Caller side | Equipment operation | Human operation at Gateway B phone 551, Receiver Side |
|---|---|---|
| Pick up phone A | 1.PSTN dial tone is heard. | |
| Dial 87654321 | 1.Communication is going<br>2.PBX plays voice greeting | |
| Dial 889 | | |
| | 1. The first LED is green at GWA<br>2.ITG dial tone is heard | |
| Dial 551 | 1.Du Du is heard<br>2.VoIP Communication is going | |
| Ring back tone is heard | | |
| | 1. The second LED is on at GWB | Phone 551 is ringing |
| | | Pick up phone 551 |
| Enjoy VoIP | | Enjoy VoIP |

The above process is the same as Phone A calls to phone numbers 200, 201, 800, 801 or 550

# Chapter 5 Application Samples

This section discusses the various environments and situations where you can use the Internet Telephony Gateway.

## 5.1 Module Configuration

Internet Telephony Gateway supports FXS and FXO modules.

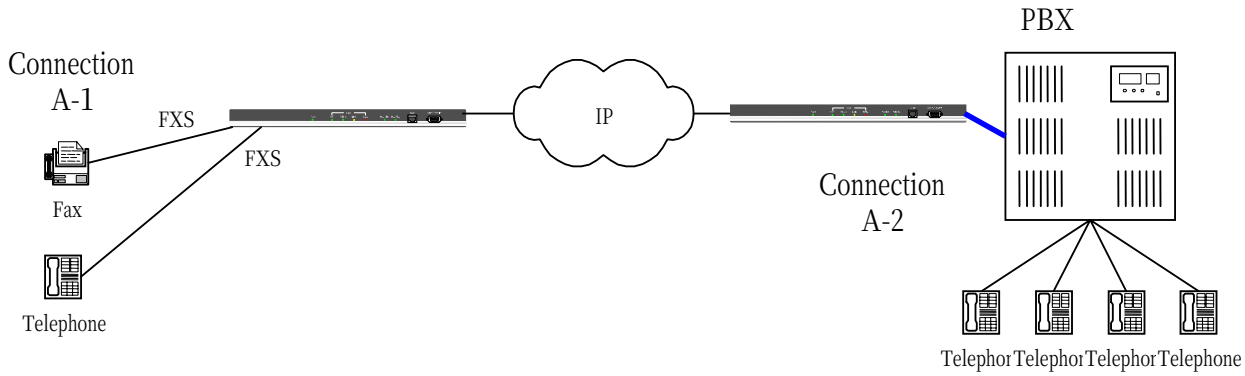
FXS (Foreign Exchange Station)
FXS provides power and ringing signals to its interfacing equipment. It is ***not*** intended for connection to the Public Switched Telephone Network. It is a station loop start operation that provides a connection to:
1. a standard, single-line analog telephone system
2. the line circuit of a key telephone system
3. a loop start trunk circuit of a Private Branch Exchange (PBX) that normally connects to incoming Central Office circuits

FXO (Foreign Exchange Office)
FXO recognizes signals and draws current to indicate an active state. It is a trunk loop start operation that emulates a single-line telephone to:
1. Central Office lines
2. PBX station

There are three basic environments that the ITG can be applied to. They are described in the following sections.

**Application A: FXS**

Application-A has two possible connections. The A-1 connection shows the connection between the gateway to telephone set (POTS) or FAX machine. The FXS module is used in the A-1 connection. The other connection A-2, on the right hand side, is used to connect the gateway and PBX that has the CO trunk interface. FXS is also used in this connection. The telephone sets connected to PBX can be either POTS or digital telephone depending upon the PBX capability.



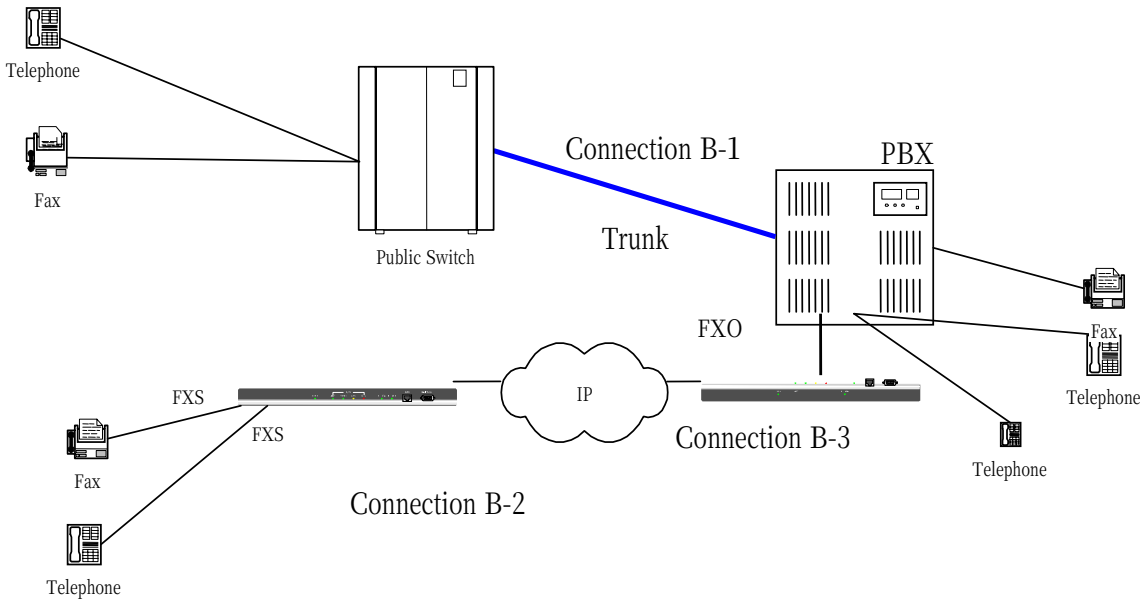
## Application B: FXS / FXO combination

Application-B has three possible connections. The B-1 connection is a normal trunk connection between the CO switch and PBX. The B-2 connection is identical to the A-1 connection mentioned in Application A. The B-3 connection is used to connect the PBX and gateway through the internal analogue lines provided by the PBX. In this case, the FXO module has to be used, and the FXO ports will serve the same roles as the analogue telephone sets.

***Note: If the PBX used in the B-3 connection is a digital type, a certain analog terminal adapter is needed to provide an analog interface to the FXO module.***

In this application, The caller in the B-2 connection can use the Gateway through its FXS module to communicate with the party on the other end in the B-3 connection. The phone call is forwarded through the FXS module in the B-2 Gateway and is received by the FXO module in the B-3 gateway, which is connected to the PBX, which will then switch to the dedicated terminal.

The same caller can also use the feature that the Gateway provides to redial the local number through the PBX, to the public switch, in order to reach the person inside the region that the public switch serves.



# Chapter 6 Troubleshooting Tips

This section provides solutions for problems you may possibly encounter while installing and connecting your Internet Telephony Gateway.

Power (PWR) LED is not illuminate

1. Check the power adapter connection.
2. If the power adapter or power cord is connected to the gateway, check that the cord is securely plugged into the power socket on the rear of the console.
3. Check that the other end of the power adapter or power cord is securely plugged into the power outlet.
4. If both ends of the power cord are properly connected and there is still no power, the gateway might have a faulty power outlet, power adapter, or power cord.
5. Change to another power outlet or obtain another power adapter or power cord.

LNK LED is not illuminate

1. Check the ITG was connected correctly:
   a. Powered on
   b. Correctly connected
2. Check if the cable connect to an end device is a standard straight through network Ethernet cable.
3. Make sure connectors at both end are securely seated.
4. Check the ITG IP setting is correct

Line module port LED is not illuminate when pick up the phone

1. Check the RJ11 telephone line is connected correctly between phone set and line module port

There is no dial tone when pick up the phone

1. Check line module port LED illuminate
2. Check the RJ11 telephone line is connected correctly between phone set and line module port

There is an out-of-service tone when dialing destination phone number

1. Check the dial plan setting (address table, hunt group table and destination table) at the destination phone number

There is no connected tone when dialing destination phone number

1. Check the IP network (Ethernet cable, Ethernet port and GW IP setting) is connected correctly
2. Check the destination ITG and phone is available

Final Steps

If the procedures in this section have not solved the problem, reset the gateway

several times by turning the power on and off. If the problem still exists, contact customer support.